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KED & ASSOCIATES, LLP
P.O. Box 221200
Chantilly, VA 20153-1200

EXAMINER	
MCCOMMAS, STUART S	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,387	YOON, SANG-JIN	
	Examiner	Art Unit	
	Stuart McCommas	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,9-13,17-19 and 24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,9-13,17-19 and 24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over embodiment 2 of Takayama et al. (United States Patent 6,249,087), hereinafter referenced as Takayama in view of embodiment 8 of Takayama, and further in view of Takeda et al. (United States Patent Application Publication 2002/0075206), hereinafter referenced as Takeda, and further in view of Kang et al. (United States Paten Application Publication 2002/0033675), hereinafter referenced as Kang.

Regarding claim 1, Takayama in embodiment 2 discloses a driving apparatus for a plasma display panel, comprising:

a set-up supplier (drive unit 80) for supplying an initialing pulse (V1y) to scan electrodes in an initialization period and for supplying a positive enhancing pulse (V2y) to the scan electrodes during an enhancing period following said initialization period wherein the initialing pulse increases to a peak voltage and the positive enhancing pulse has a maximum voltage less than the peak voltage (figure 1; figure 7; table 5; table 7);

a negative voltage supplier (drive unit 80) for supplying a negative enhancing pulse (V3y) to the scan electrodes during the enhancing period (table 5; figure 1; figure 7).

However Takayama fails to disclose supplying a decreasing pulse to the scan electrodes in the initialization period and wherein a ground voltage is applied to the sustain electrodes when the positive enhancing pulse is applied to the scan electrode and when the negative enhancing pulse is applied to the scan electrodes in embodiment 2.

In embodiment 8 Takayama discloses supplying a decreasing pulse (V22y) to the scan electrodes in the initialization period (figure 15).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify embodiment 2 of Takayama with embodiment 8 of Takayama by specifically providing supplying a decreasing pulse to the scan electrodes in the initialization period for the purpose of precisely controlling discharge in a display to improve the quality of the display and to minimize the number of initializations (column 12 lines 35-40).

In a similar field of invention Takeda discloses wherein a ground voltage is applied to the sustain electrodes when the positive enhancing pulse is applied to the scan electrode (figure 5).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama by specifically providing wherein a ground voltage is applied to the sustain electrodes when the positive enhancing pulse is applied to the scan electrode for the purpose of suppressing discharge errors in the display by precisely controlling discharges to improve the quality of the display (paragraph 31).

In a similar field of invention Kang discloses that a ground voltage is applied to the sustain electrodes when the negative enhancing pulse is applied to the scan electrodes (figure 7).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify embodiment 2 of Takayama with Kang by specifically providing that a ground voltage is applied to the sustain electrodes when the negative enhancing pulse is applied to the scan electrodes for the purpose of providing uniform wall charge during the period prior to displaying an image to improve the quality of the display (paragraph 73).

3. Claims 9, 11-12, 17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over embodiment 2 of Takayama in view of embodiment 8 of Takayama and further in view of Takeda et al. (United States Patent Application Publication 2002/0075206), hereinafter referenced as Takeda.

Regarding claim 9, Takayama in embodiment 2 discloses a plasma display device comprising:

a plasma display panel (PDP) having scan electrodes and sustain electrodes to form a plurality of electrode pairs (figure 1);

a first driving circuit (scan driver 86) that initializes discharge cells by applying a first signal having an initialing pulse (V1y) to the scan electrodes during a reset period (TR) of at least one sub-field, the initialing pulse increasing to a first maximum voltage value (figures 7-8; tables 7-8);

wherein the first driving circuit applies a second signal having an enhancing pulse (V2y) to the scan electrodes after applying the first signal in the reset period and before an address period of the at least one sub-field, wherein the second signal further has a second decreasing pulse (V3y) provided after the enhancing pulse in the at least one subfield, where the enhancing pulse is increasing to a second maximum voltage value less than the first maximum voltage value (figures 7-8; tables 7-8).

However Takayama fails to disclose wherein the first signal further has a first decreasing pulse provided after the initialing pulse during the reset period of the at least one sub-field and wherein the first decreasing pulse is provided until a voltage provided to the scan electrodes reaches a first voltage value, and the second decreasing pulse is provided until the voltage provided to the scan electrodes reaches a second voltage value, wherein the first and second voltage values are different, and wherein a ground voltage is applied to the sustain electrodes when the enhancing pulse is applied to the scan electrodes in embodiment 2.

In embodiment 8 Takayama discloses wherein the first signal further has a first decreasing pulse (V22y) provided after the initialing pulse during the reset period of the at least one sub-field (figure 1; figure 15).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify embodiment 2 of Takayama with embodiment 8 of Takayama by specifically providing wherein the first signal further has a first decreasing pulse provided after the initialing pulse during the reset period of the at least one sub-

field for the purpose of precisely controlling discharge in a display to improve the quality of the display and to minimize the number of times needed to do the refresh period.

In a similar field of invention Takeda discloses wherein the first gradually falling waveform (A12) is provided until a voltage provided to the scan electrodes reaches a first voltage, the second gradually falling waveform (A13) is provided until the voltage reaches a second voltage value, wherein the first and second voltages are different (figure 5). Further Takeda discloses wherein a ground voltage is applied to the sustain electrodes when the enhancing pulse is applied to the scan electrodes (figure 5)

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama with Takeda by specifically providing wherein the first gradually falling waveform is provided until a voltage provided to the scan electrodes reaches a first voltage, the second gradually falling waveform is provided until the voltage reaches a second voltage value, wherein the first and second voltages are different, and wherein a ground voltage is applied to the sustain electrodes when the enhancing pulse is applied to the scan electrodes for the purpose of suppressing discharge errors in the display by precisely controlling discharges to improve the quality of the display (paragraph 31).

Regarding claim 11, embodiments 2 and 8 of Takayama, and Takeda, the combination discloses everything as applied above, further embodiment 2 of Takayama discloses that a difference between the first max voltage value and the second max voltage value is substantially the same as a sustain voltage applied to the scan

electrodes or sustain electrodes in sustain period of at least one sub-field (figures 7-8; tables 7-8).

Regarding claim 12, embodiments 2 and 8 of Takayama, and Takeda, the combination discloses everything as applied above, further embodiment 2 of Takayama discloses that a slope of the initialing pulse is substantially the same as a slope of the enhancing pulse (figure 7).

Regarding claim 17, embodiments 2 and 8 of Takayama and Takeda, the combination disclose everything as applied above, further Takeda discloses that the magnitude of the second voltage value is greater than the first voltage value (figure 5).

Regarding claim 19, Takayama discloses a method of driving a plasma display panel based on a plurality of sub-fields, the plasma display panel having a plurality of discharge cells, and each of the cells having a scan electrode and a sustain electrode (figure 1), comprising:

providing a first signal including an initialing pulse (V1y) to the scan electrode during an initialization period of at least one sub-field (tables 7-8; figures 7-8);

providing a second signal including an enhancing pulse (V2y) followed by a second decreasing pulse (V3y) to the scan electrode after providing the first signal and during the at least one subfield (tables 7-8; figures 7-8);

providing a scan signal to the scan electrode during an address period of the at least one sub-field, the scan signal being provided after the second signal in the at least one subfield (tables 7-8; figures 7-8);

providing at least one sustain signal to at least one of the scan electrode or the sustain electrode during a sustain period of the at least one sub-field (tables 7-8; figures 7-8);

wherein the initialing pulse of the first signal has a first peak voltage value and the enhancing pulse of the second signal has a second peak voltage value, wherein the first peak voltage value is greater than the second peak voltage value (tables 7-8; figures 7-8).

However Takayama fails to disclose an initialing pulse followed by a first decreasing pulse, and wherein a lowest voltage of the first decreasing pulse is less than a lowest voltage of the second decreasing pulse, and wherein a ground voltage is applied to the sustain electrodes when the second signal is provided to the scan electrodes.

In embodiment 8 Takayama discloses an initialing pulse followed by a first decreasing pulse (V22y) (figure 1; figure 15).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify embodiment 2 of Takayama with embodiment 8 of Takayama by specifically providing an initialing pulse followed by a first decreasing pulse for the purpose of precisely controlling discharge in a display to improve the quality of the display and to minimize the number of times needed to do the refresh period.

In a similar field of invention Takeda discloses wherein a lowest voltage of the first decreasing pulse is less than a lowest voltage of the second decreasing pulse

(figure 5). Further Takeda discloses wherein a ground voltage is applied to the sustain electrodes when the second signal is provided to the scan electrodes (figure 5)

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama with Takeda by specifically providing wherein a lowest voltage of the first decreasing pulse is less than a lowest voltage of the second decreasing pulse and wherein a ground voltage is applied to the sustain electrodes when the second signal is provided to the scan electrodes for the purpose of suppressing discharge errors in the display by precisely controlling discharges to improve the quality of the display (paragraph 31).

4. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over embodiment 2 of Takayama et al. (United States Patent 6,249,087), hereinafter referenced as Takayama in view of embodiment 8 of Takayama, and further in view of Takeda et al. (United States Patent Application Publication 2002/0075206), hereinafter referenced as Takeda, and further in view of Kang et al. (United States Paten Application Publication 2002/0033675), hereinafter referenced as Kang.

Regarding claim 13, embodiments 2 and 8 of Takayama, and Takeda, the combination discloses everything as applied above, further Takayama in embodiment 2 discloses a second decreasing pulse (figures 7-8), however the combination fails to disclose wherein a ground voltage is applied to the sustain electrodes when the pulse is applied to the scan electrodes.

In a similar field of invention Kang discloses that a ground voltage is applied to the sustain electrodes when the pulse is applied to the scan electrodes (figure 7).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify embodiments 2 and 8 of Takayama and Takeda with Kang by specifically providing that a ground voltage is applied to the sustain electrodes when the pulse is applied to the scan electrodes for the purpose of providing uniform wall charge during the period prior to displaying an image to improve the quality of the display (paragraph 73).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over embodiment 2 of Takayama in view of embodiment 8 of Takayama and Takeda, and further in view of Takayama (United States Patent 6,747,614), hereinafter referenced as 614.

Regarding claim 10, Takayama and Takeda, the cominbation discloses everything as applied above, however the combination fails to disclose wherein the second maximum voltage value is lower than a sustain voltage applied to the scan electrodes or applied to the sustain electrodes in a sustain period of the at least one subfield.

In a similar field of invention 614 discloses wherein the second maximum voltage value is lower than a sustain voltage applied to the scan electrodes or applied to the sustain electrodes in a sustain period of the at least one subfield (figure 4).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama and Takeda with 614 by specifically providing wherein the second maximum voltage value is lower than a sustain voltage applied to the scan electrodes or applied to the sustain electrodes in a sustain period of the at least one subfield for the purpose of precisely controlling discharges in a display to improve the quality of the display (column 6 lines 12-32).

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over embodiment 2 of Takayama in view of embodiment 8 of Takayama, Takeda and further in view of Homma (United States Patent Application Publication 2002/0063663), hereinafter referenced as Homma.

Regarding claim 18, embodiments 2 and 8 of Takayama and Takeda, the combination discloses everything as applied above, however the combination fails to disclose wherein a voltage substantially similar to a sustain voltage provided to the scan electrodes or the sustain electrodes during a sustain period is provided to the sustain electrodes when the first decreasing pulse is applied to the scan electrodes.

In a similar field of invention Homma discloses wherein a voltage substantially similar to a sustain voltage provided to the scan electrodes or the sustain electrodes during a sustain period is provided to the sustain electrodes when the first decreasing pulse is applied to the scan electrodes (paragraphs 60-61; figure 9).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of embodiments 2 and 8 of

Takayama and Takeda with Homma by specifically providing wherein a voltage substantially similar to a sustain voltage provided to the scan electrodes or the sustain electrodes during a sustain period is provided to the sustain electrodes when the first decreasing pulse is applied to the scan electrodes for the purpose of conserving power and improving brightness by using a common voltage value during both the initialization period and the sustaining period (paragraph 38).

7. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over embodiment 2 of Takayama in view of embodiment 8 of Takayama and Takeda and further in view of Homma (United States Patent Application Publication 2002/0063663), hereinafter referenced as Homma.

Regarding claim 24, embodiments 2 and 8 of Takayama and Takeda, the combination discloses everything as applied above, however the combination fails to disclose wherein a sustain voltage is provided to the sustain electrode when the first signal is provided to the scan electrode.

In a similar field of invention Homma discloses that a sustain voltage is provided to the sustain electrode when the first signal is provided to the scan electrode (paragraphs 60-61; figure 9).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify embodiments 2 and 8 of Takayama and Takeda with Homma by specifically providing wherein a sustain voltage is provided to the sustain electrode when the first signal is provided to the scan electrode for the purpose of

initiating a priming discharge and controlling wall charges to increase the quality of the display (paragraphs 12-13).

Response to Arguments

8. Applicant's arguments with respect to claims 1-25 have been considered but are believed to be answered by and therefore moot in view of the new ground(s) of rejection.

On pages 9-10, Applicants argues that embodiments 2 and 8 of Takayama can not be combined.

The Examiner respectfully disagrees, because both of these embodiments are combinable and usable together and embodiment 8 has features that can be combined with features of embodiment 2. In fact Takayama suggest such a motivation for combining these features when it discloses that the features of embodiment 8 have the advantage that the preparation process is performed ONLY for a part of the plural subfields (column 14 lines 37-40). Further both of these embodiments do disclose differing methods for charge control, but there is motivation to combine these methods as stated above because embodiment 8 is an embodiment that can be included in other embodiments when the preparation stage is performed for only a part of the subfields (column 14 lines 37-40). Employing the steps in embodiment 8 of Takayama to modify embodiment 2 of Takayama is thus obvious because the steps for charge forming and charge sharing disclosed in both embodiments are known in the art and can be substituted and rearranged to precisely control the charge in the display.

On page 12, Applicant argues that Takeda does not disclose wherein a ground voltage is provided to the sustain electrode when the second signal is provided to the scan electrode.

The Examiner respectfully disagrees, because Takeda discloses that when both a first and a second signal are applied in a setup period a ground voltage is provided to the scan electrode (figure 5). This second signal is disclosed specifically by Takayama as cited in the rejection above. The Examiner is using Takeda for the fact that the reference discloses, as claimed, that a ground voltage is applied when a second signal is applied to the scan electrode.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stuart McCommas whose telephone number is (571)270-3568. The examiner can normally be reached on Monday-Friday 9 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on (571)272-7687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Stuart McCommas
Patent Examiner
Art Unit 2629

SSM

/Alexander Eisen/

Supervisory Patent Examiner, Art Unit 2629